

REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-6 are presently active in this case. The present Amendment amends Claims 1-2 and 5 and adds new Claim 6 without introducing any new matter.

The outstanding Office Action objected to the Specification because of informalities. Claims 1-4 were rejected under 35 U.S.C. §102(b) as anticipated by Cheon (U.S. Patent No. 6,234,240). Claim 5 was rejected under 35 U.S.C. §103(a) as unpatentable over Ishikawa et al. (U.S. Patent No. 6,728,102, herein "Ishikawa") in view of Cheon (U.S. Patent No. 6,234,240).

Applicants submit herewith a certified English translation of the priority document (Japanese Patent Application No. 2002-204490, filed on July 12, 2002) along with a requisite statement pursuant to 37 C.F.R. §1.55(a)(4) to perfect the claim to priority of the present application. The Japanese priority document of the reference Ishikawa has a publication date of September 21, 2001 and therefore this reference constitutes prior art against the present application, assuming that the Japanese priority document and the reference Ishikawa have similar disclosures. Accordingly, Applicants respectfully request reconsideration of the outstanding rejections based on the arguments cited below against the reference Ishikawa.

In order to vary the scope of protection recited in the claims, new Claim 6 is added. New Claim 6 depends upon Claim 1 and recites "wherein fins are arranged on the heat intake portion and on the heat outlet portion of the active heat transportation unit, configured to be thermally connected to the active heat transportation unit."¹ Since Claim 6 finds support in the disclosure as originally filed, it is not believed to raise any question on new matter.

¹ Finds non-limiting support in Applicants' Specification at page 14, lines 4-13 and in corresponding Figure 6.

In response to the objections to the Specification as failing to provide proper antecedent basis for the claimed subject matter, Applicants respectfully traverse the objection. The meaning of every term used in the claims is believed to be clearly explained by the Specification. The cooling portion refers to an element cooling chamber 13, a first flow channel refers to a coolant cooling chamber 11, a second flow channel refers to a coolant heating chamber 15 and an active heat transport element refers to a Peltier element 31.²

In particular, the Peltier element 31 is exemplified as an active heat transport element. The Specification discloses that a cooling medium can flow through the coolant cooling chamber 11, hence the coolant cooling chamber functions as a flow channel.³ Further, the Specification teaches that the cooling medium flows from the coolant cooling chamber 11 to the element cooling chamber 13 and cools a CPU 7 (an electronic element) with the cooling chamber 13.⁴ Therefore the coolant cooling chamber 11 can be interpreted as a first flow channel disposed upstream of the electronic element in the flow of the cooling medium. The same is applied to the coolant heating chamber 15. Therefore the coolant heating chamber 15 can be interpreted as a second flow channel disposed downstream of the electronic element in the flow of the cooling medium. Further, Applicants' Specification discloses that the heat intake portion of the Peltier element 31 is thermally connected with the coolant cooling chamber 11 so as to conduct heat from the cooling medium and the heat outlet portion is thermally connected with the coolant heating chamber 15 so as to conduct heat to the cooling medium.⁵ Accordingly, Applicants respectfully submit that the Specification provides antecedent basis for all the elements recited in the claims.

² See Applicants' Specification at pages 8-9 and in corresponding Figures 1A-1C.

³ See Applicants' Specification at page 9, lines 3-4.

⁴ See Applicants' Specification at page 9, lines 18-19 and page 10, lines 16-24.

⁵ See Applicants' Specification from page 9, last line to page 10, line 2.

In response to the rejection of Claims 1-4 under 35 U.S.C. §102(b) over Cheon, Applicants respectfully request reconsideration of this rejection and traverse the rejection, as discussed next.

Briefly recapitulating, Applicants' invention, as recited in Claim 1, relates to a cooling device configured to cool an electronic element producing concentrated heat by a flow of a cooling medium, including a first flow channel disposed upstream of the electronic element in the flow of the cooling medium; a second flow channel disposed downstream of the electronic element in the flow of the cooling medium; and an active heat transport element including a heat intake portion and a heat outlet portion, the active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion, wherein the heat intake portion is thermally connected with the first flow channel so as to conduct heat from the cooling medium, and the heat outlet portion is thermally connected with the second flow channel so as to conduct heat to the cooling medium.

Turning now to the applied references, Cheon discloses a fanless cooling system for computers, wherein a heat transfer device 22, through which a liquid coolant C circulates, is mounted in heat-exchanging contact on a microprocessor chip 10. The heat transfer device 22 may be directly mounted to the chip 10 or via a peltier thermoelectric cooler 14.⁶ However, Cheon fails to disclose the heat intake portion being thermally connected with the first flow channel so as to conduct heat from the cooling medium, and fails to teach the heat outlet portion being thermally connected with the second flow channel so as to conduct heat to the cooling medium, as claimed by Applicants. Cheon teaches a cold side 18 and a hot side 16 of a Peltier thermoelectric cooler 14, since a Peltier element conducts heat from a cold side to the hot side. However, Cheon discloses that the cold side 18 is thermally connected to a microprocessor chip 10, **and not** to a first flow channel and the hot side 16 is

⁶ See Cheon in the Abstract.

thermally connected to a heat transfer device 22, which *is not* a second flow channel.⁷

Accordingly, a Peltier element connected on the cold side to a microprocessor chip and connected on the hot side to a heat transfer device, as taught by Cheon, *is not* an active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion, the heat intake portion being thermally connected with the first flow channel so as to conduct heat from the cooling medium, the heat outlet portion being thermally connected with the second flow channel so as to conduct heat to the cooling medium. Accordingly, Applicants respectfully request reconsideration of the rejection of Claims 1-4 under 35 U.S.C. §102(b).

In response to the rejection of Claim 5 under 35 U.S.C. §103(a) in view of Ishikawa and Cheon, Applicants respectfully traverse the rejection and request reconsideration of this rejection, as discussed next.

Ishikawa discloses an electronic apparatus including a cooling unit for cooling a heat generating component, wherein the cooling unit is arranged inside a display housing.⁸ However, Ishikawa fails to disclose Applicants' claimed active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion, as acknowledged by the outstanding Office Action.⁹ Ishikawa merely discloses a heat transmitting case 34 divided in the inside into flow paths 36 for conducting liquid coolant.¹⁰

The outstanding Office Action rejects Applicants' Claim 5 based on the proposition that Cheon discloses the above feature¹¹, and that it would have been obvious to modify Ishikawa by importing this feature from Cheon to arrive at Applicants' claimed invention. Applicants respectfully submit, however, that Cheon also fails to disclose the above feature

⁷ See Cheon at column 3, lines 28-40 and in corresponding Figure 3.

⁸ See Ishikawa in the Abstract and at column 10, lines 10-11.

⁹ See the outstanding Office Action at page 5, line 8.

¹⁰ See Ishikawa at column 8, lines 35-51 and in corresponding Figures 3 and 16.

¹¹ See the outstanding Office Action at page 5, line 9.

related to an active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion, as next discussed.

The outstanding Office Action relies on Cheon in Figure 3. Cheon shows a peltier thermoelectric cooler in Figure 3, and further discloses that a peltier cooler is located between a microprocessor chip and a heat transfer device.¹² Reading Cheon, a person of ordinary skill in the art would understand that a peltier cooler located between a microprocessor chip and a heat transfer device, as taught by Cheon, *is not* an active heat transport element *configured to conduct heat from the heat intake portion to the heat outlet portion*.

Accordingly, Cheon does not remedy the deficiencies of Ishikawa. Therefore, even if the combination of Ishikawa and Cheon is assumed to be proper, the combination fails to teach every element of the claimed invention. Accordingly, Applicants respectfully traverse the rejection under 35 U.S.C. §103(a) and request reconsideration of the rejection of Claim 5.

Consequently, in view of the present Amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-6 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

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¹² See Cheon in the Abstract and at column 3, lines 25-28.